

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A support arm, comprising:

~~a first strut having a proximal portion pivotally coupled to a proximal link at a first proximal joint;~~

a proximal link pivotally coupled to the proximal portion of the first strut at a first proximal joint, the proximal link comprising a cam, wherein the first strut is rotatable relative to the cam about the first proximal joint;

a distal link pivotally coupled to a distal portion of the first strut at a first distal joint, wherein the first strut is rotatable relative to the distal link about the first distal joint; and

~~a cam coupled to one of the links;~~

a cam follower coupled to the first strut, the cam follower contacting a cam surface of the cam at a first contact point; the cam and the cam follower cooperating to apply a cam moment to the first strut; and the cam moment being sufficient to balance a load supported by the distal link.

2. (original) The support arm of claim 1, further comprising a means for urging the cam follower against the cam surface of the cam.

3. (original) The support arm of claim 2, wherein the means for urging the cam follower against the cam surface of the cam comprises an energy source.

4. (original) The support arm of claim 3, further comprising an adjustment mechanism for varying an output of the energy source.
5. (original) The support arm of claim 2, wherein the means for urging the cam follower against the cam surface of the cam comprises a spring.
6. (currently amended) The support arm of claim 5[3], further comprising an adjustment mechanism for varying a characteristic of the spring.
7. (original) The support arm of claim 6, wherein the adjustment mechanism comprises a spring plate coupled to the spring.
8. (original) The support arm of claim 7, wherein the adjustment mechanism comprises a screw for adjusting a position of the spring plate.
9. (original) The support arm of claim 8, wherein the screw threadingly engages a threaded portion of the spring plate.
10. (original) The support arm of claim 1, wherein a strut angle is defined by a longitudinal axis of the first strut and a direction of gravitational pull.
11. (original) The support arm of claim 10, wherein the cam moment varies as a function of a trigonometric SIN of the strut angle when the first strut rotates relative to the cam.

12. (original) The support arm of claim 11, wherein the cam moment varies in proportion to a trigonometric SIN of the strut angle when the first strut rotates relative to the cam.

13. (currently amended) The support arm of claim 10, wherein a contact angle is defined by a line that is perpendicular to the longitudinal axis of the first strut and a tangent line that is generally tangent to both the cam follower and the cam surface and that extends through the first contact point.

14-17. (canceled)

18. (currently amended) The support arm of claim 13[10], wherein the cam provides a reaction force supporting the cam follower when the cam follower is urged against the cam.

19. (currently amended) The support arm of claim 18, wherein the cam moment is provided by a moment creating component of the reaction force.

20. (original) The support arm of claim 19, wherein the cam is shaped so that the moment creating component of the reaction force varies as the first strut rotates relative to the cam.

21. (currently amended) The support arm of claim 19[18], wherein the moment creating component of the reaction force varies as a function of the contact angle as the first strut rotates relative to the cam.

22. (original) The support arm of claim 18, wherein the cam is shaped so that the contact angle varies as the first strut rotates relative to the cam.

23. (original) The support arm of claim 22, wherein the cam is shaped so that a trigonometric TAN function of the contact angle varies as a function of a trigonometric SIN of the strut angle when the first strut rotates relative to the cam.

24. (currently amended) The support arm of claim 1[18], wherein the cam is shaped so that a deflection of a spring varies as the first strut rotates relative to the cam.

25. (original) The support arm of claim 24, wherein the deflection of the spring varies as a function of a trigonometric SIN of the strut angle when the first strut rotates relative to the cam.

26. (currently amended) The support arm of claim 1[18], wherein the cam is shaped so that a radius of the cam varies when the first strut rotates relative to the cam.

27. (currently amended) The support arm of claim 26, wherein the cam is shaped so that the[a] radius of the cam varies as a function of a trigonometric SIN of the strut angle when the first strut rotates relative to the cam.

28. (currently amended) The support arm of claim 1[18], wherein the cam is shaped so that a radius of curvature of the cam varies when the first strut rotates relative to the cam.

29. (original) The support arm of claim 28, wherein the cam is shaped so that a radius of curvature of the cam varies as a function of a trigonometric SIN of the strut angle when the first strut rotates relative to the cam.

30. (currently amended) The support arm of claim 13[1], wherein the cam is shaped such that the[a] contact angle of the cam follower changes when the first strut is rotated relative to the cam.

31. (original) The support arm of claim 1, wherein a spring is extended as the first strut rotates so that the first distal joint moves in a downward direction.

32. (original) The support arm of claim 1, wherein a spring is compressed as the first strut rotates so that the first distal joint moves in a downward direction.

33. (original) The support arm of claim 32, wherein the spring comprises a coil spring.

34. (withdrawn) The support arm of claim 32, wherein the spring comprises a leaf spring.

35. (withdrawn) The support arm of claim 32, wherein the spring comprises an elastomeric material.

36. (withdrawn) The support arm of claim 32, wherein the spring comprises a spring selected from the group consisting of: compression springs, extension springs, torsion springs, and constant force springs.

37. (canceled)

38. (original) The support arm of claim 1, wherein the cam surface has a substantially continually changing slope.

39. (original) The support arm of claim 1, wherein the cam surface has a substantially continually changing radius of curvature.

40. (original) The support arm of claim 1, wherein the cam has a substantially continually changing radius.

41. (canceled)

42. (currently amended) The support arm of claim 1, further comprising a second strut having a proximal portion pivotally coupled to the proximal link at a second proximal joint and a distal portion pivotally coupled to the distal link at a second distal joint, wherein the first strut, the second strut, the proximal link, and the distal link form a parallelogram.

43. (canceled)

44. (original) The support arm of claim 6, wherein the adjustment mechanism varies a pre-load of the spring.

45. (withdrawn) The support arm of claim 6, wherein the adjustment mechanism varies an angle of the spring.

46. (original) The support arm of claim 6, wherein the adjustment mechanism varies a length of the spring.

47. (new) The support arm of claim 1, further comprising a stop to inhibit movement of the cam follower along the cam surface.

48. (new) The support arm of claim 1, further comprising a mounting assembly that includes:

a first structural member pivotally coupled to the distal link;

a second structural member pivotally coupled to the first structural member; and
a mounting bracket pivotally coupled to the second structural member, the mounting
bracket being configured to rotate relative to the distal link about at least three different axes.

49. (new) The support arm of claim 1, wherein the proximal link defines a channel
configured to receive a mounting pole, the proximal link being rotatable about the mounting
pole.

50. (new) A support arm, comprising:
a first strut having a proximal portion and defining a lumen;
a proximal link pivotally coupled to the proximal portion of the first strut at a first
proximal joint, the proximal link comprising a cam, wherein the first strut is rotatable relative to
the proximal link about the first proximal joint;
a distal link pivotally coupled to a distal portion of the first strut at a first distal joint,
wherein the first strut is rotatable relative to the distal link about the first distal joint; and
a cam follower coupled to the first strut and housed substantially within the lumen
defined by the first strut, the cam follower contacting a cam surface of the cam at a first contact
point, the cam and the cam follower cooperating to apply a cam moment to the first strut, the
cam moment being sufficient to balance a load supported by the distal link.

51. (new) The support arm of claim 50, further comprising a stop to inhibit
movement of the cam follower along the cam surface.

52. (new) The support arm of claim 50, further comprising a mounting assembly that includes:

a first structural member pivotally coupled to the distal link;
a second structural member pivotally coupled to the first structural member; and
a mounting bracket pivotally coupled to the second structural member, the mounting bracket being configured to rotate relative to the distal link about at least three different axes.

53. (new) The support arm of claim 50, wherein the first strut is operable to rotate relative to the proximal link about the first proximal joint between a first position in which the distal portion of the first strut is below a horizontal plane extending through the first proximal joint and a second position in which the distal portion of the first strut is above the horizontal plane.

54. (new) The support arm of claim 50, wherein the proximal link defines a channel configured to receive a mounting pole, the proximal link being rotatable about the mounting pole.

55. (new) A support arm, comprising:
a first strut having a proximal portion;
a proximal link pivotally coupled to the proximal portion of the first strut at a first proximal joint, wherein the first strut is operable to rotate relative to the proximal link about the first proximal joint between a first position in which the distal portion of the first strut is below a

horizontal plane extending through the first proximal joint and a second position in which the distal portion of the first strut is above the horizontal plane;

 a distal link pivotally coupled to a distal portion of the first strut at a first distal joint, wherein the first strut is rotatable relative to the distal link about the first distal joint;

 a cam coupled to either the proximal link or the first strut; and

 a cam follower coupled to either the first strut or the proximal link, the cam follower contacting a cam surface of the cam at a first contact point, the cam and the cam follower cooperating to apply a cam moment to the first strut, the cam moment being sufficient to balance a load supported by the distal link.

56. (new) The support arm of claim 55, wherein both the cam and the cam follower are coupled to the proximal link.

57. (new) The support arm of claim 55, wherein the cam is coupled to the proximal link and the cam follower is coupled to the first strut.

58. (new) The support arm of claim 61, wherein the cam is coupled to the proximal link and the cam follower is coupled to the first strut, and wherein the first strut defines a lumen and the cam follower is housed substantially within the lumen.

59. (new) The support arm of claim 55, further comprising a stop to inhibit movement of the cam follower along the cam surface.

60. (new) The support arm of claim 55, further comprising a mounting assembly that includes:

a first structural member pivotally coupled to the distal link;
a second structural member pivotally coupled to the first structural member; and
a mounting bracket pivotally coupled to the second structural member, the mounting bracket being configured to rotate relative to the distal link about at least three different axes.

61. (new) The support arm of claim 55, wherein the proximal link defines a channel configured to receive a mounting pole, the proximal link being rotatable about the mounting pole.

62. (new) A support arm, comprising:
a first strut having a proximal portion;
a proximal link pivotally coupled to the proximal portion of the first strut at a first proximal joint, the proximal link comprising a cam, wherein the first strut is rotatable relative to the cam about the first proximal joint;
a distal link pivotally coupled to a distal portion of the first strut at a first distal joint, wherein the first strut is rotatable relative to the distal link about the first distal joint; and
a cam follower coupled to the first strut, the cam follower contacting a cam surface of the cam at a first contact point, the cam and the cam follower cooperating to apply a cam moment to the first strut, the cam moment being sufficient to balance a load supported by the distal link; and
a mounting assembly that includes (a) a first structural member pivotally coupled to the distal link, (b) a second structural member pivotally coupled to the first structural member, and

(c) a mounting bracket pivotally coupled to the second structural member, the mounting bracket being configured to rotate relative to the distal link about at least three different axes.

63. (new) The support arm of claim 62, further comprising a stop to inhibit movement of the cam follower along the cam surface.

64. (new) The support arm of claim 62, wherein the first strut is operable to rotate relative to the proximal link about the first proximal joint between a first position in which the distal portion of the first strut is below a horizontal plane extending through the first proximal joint and a second position in which the distal portion of the first strut is above the horizontal plane.

65. (new) The support arm of claim 62, wherein the first strut defines a lumen and the cam follower is housed substantially within the lumen.

66. (new) The support arm of claim 62, wherein the proximal link defines a channel configured to receive a mounting pole, the proximal link being rotatable about the mounting pole.